

We claim

- 5 1. A cholesteric layered material comprising at least one three-dimensionally crosslinked, aligned cholesteric layer, wherein the crosslinked cholesteric layer(s) does (do) not exhibit any color shift which can be induced by external stimuli.
- 10 2. A cholesteric layered material as claimed in claim 1, wherein the external stimuli are selected from changes in the temperature of the layered material, in particular warming, the action of diluents on the layered material, and
- 15 combinations thereof.
3. A cholesteric layered material as claimed in claim 2, which exhibits no color shift on
- 20 a) a change in the temperature in the range from -30°C to 250°C;
- b) warming to temperatures in the range from 80 to 160°C with simultaneous exposure to a diluent; and/or
- 25 c) treatment for 15 minutes at 80°C in xylene followed by drying.
4. A cholesteric layered material as claimed in one of the
- 30 preceding claims, wherein the reflection maximum of the cholesteric layer after the xylene treatment can be shifted by not more than about 10 nm into the higher or lower wavelength region.
- 35 5. A cholesteric layered material as claimed in one of the preceding claims, wherein the cholesteric layer has a mean dry layer thickness of less than about 5  $\mu\text{m}$ , in particular less than about 2  $\mu\text{m}$ , preferably less than or equal to about 1  $\mu\text{m}$ .
- 40 6. A cholesteric layered material as claimed in one of the preceding claims, wherein the cholesteric layer has a mean

7. A cholesteric layered material as claimed in one of the preceding claims, which comprises a plurality of color shift-stable cholesteric layers of identical or different thickness and identical or different chemical composition.
- 5 8. A cholesteric pigment comprising at least one crosslinked, aligned cholesteric layer having a mean particle size in the range from 5 to 50  $\mu\text{m}$  and a thickness of from 0.2 to 5  $\mu\text{m}$ , wherein the crosslinked cholesteric layer(s) exhibits
- 10 (exhibit) no visually evident color shift.
9. A process for the production of a cholesteric layered material as claimed in claim 1, which comprises:
- 15 a) casting and simultaneous alignment of a cholesteric coating composition comprising at least one crosslinkable substance onto a support with formation of a first cholesteric layer, where the support is essentially chemically inert to the cholesteric layer to be applied;
- 20 b) drying and crosslinking of the applied layer, where the conditions are selected in such a way that the resultant layer exhibits no visually evident color shift;
- 25 c) removal of the layered material from the support after one or more further aligned cholesteric layers have, if desired, been applied to the layer obtained in accordance with step a).
- 30 10. A process as claimed in claim 9, wherein a support is employed which does not adversely affect the alignment of the cholesteric layer cast thereon during drying and curing.
11. A process as claimed in one of claims 9 and 10, wherein the
- 35 support has an adhesive strength of less than about 1 cN to the dried and crosslinked first cholesteric layer cast thereon.
12. A process as claimed in one of claims 9 to 11, wherein a
- 40 layered material comprising a plurality of cholesteric layers is produced, where the second layer can be removed selectively from the first layer on the support as a

13. A process as claimed in one of claims 9 to 12, wherein the support is selected from plastic, metal, glass and ceramic supports.
- 5 14. A process as claimed in claim 13, wherein the plastic support comprises a release layer of crosslinked, preferably aligned, cholesteric material onto which the first cholesteric layer is cast.
- 10 15. A process as claimed in claim 14, wherein the adhesion between plastic support and release layer is at least about twice the adhesion between release layer and first cholesteric layer.
- 15 16. A process as claimed in one of claims 9 to 15, wherein the coating compositions for the cholesteric layer(s) and the release layer independently of one another have a viscosity in the range from about 1 to 50 mPas, and the coating rate is in the range from about 1 to 800 m/min.
- 20 17. A process as claimed in one of claims 9 to 16, wherein the crosslinking of the cholesteric layer(s) and of any cholesteric release layer present is carried out by electron beams or UV radiation with simultaneous warming of the layer
- 25 to be cured, where the emitter power is in the range from about 50 to 200 watts/cm.
18. A process as claimed in claim 17, wherein the layer temperature during the radiation curing is at least 60°C, in particular at least 80°C, preferably at least 90°C.
- 30 19. A process as claimed in one of claims 9 to 18, wherein a further support film is applied to the cholesteric layer applied last, and the one or more cholesteric layer(s) is (are) removed from the support as a composite.
- 35 20. A process as claimed in one of claims 9 to 18, wherein one or more cholesteric layer(s) is (are) removed from the support by blasting with compressed air, a water jet, steam or with the aid of a knife coater and ground to give pigments.
- 40 21. A process as claimed in one of claims 9 to 18, wherein one or more cholesteric layer(s) is (are) removed from the support by blasting with compressed air, a water jet, steam or with the aid of a knife coater and ground to give pigments.
- 45 22. The use of layered material as claimed in one of claims 7 or of a pigment as claimed in claim 8 in the motor vehicle or motor vehicle accessory sector, in the computer, leisure,

- 5 sport and toy sector, in optical components, such as  
polarizers or filters, in the cosmetics area, in the  
textiles, leather or jewelry area, in gift articles, in  
writing implements or on spectacle frames, in the  
construction sector, in the domestic sector, in print  
products of all types, in the production of paints and  
coatings, for the anticounterfeiting treatment of articles.
- 10 23. The use of a composition as claimed in claim 21 for the  
coating of utility articles or for the painting of motor  
vehicles.
- 15 24. A polarizer comprising a layered material as claimed in one  
of claims 1 to 7, if desired applied to a support film.
- 20 25. A broad-band polarizer comprising a layered material as  
claimed in one of claims 1 to 7 having a number of from 3 to  
20 cholesteric layers with reflection maxima matched to one  
another, where the polarizer has a total thickness (without  
support film) in the range from about 2 to 50  $\mu\text{m}$ .

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